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# Reducing occupational sitting time in adults with type 2 diabetes: Qualitative experiences of an office-adapted mHealth intervention

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## Abstract

**Aim:** Understanding barriers and facilitators for limiting occupational sitting and what impact it has on health on those with type 2 diabetes is essential for future trials and intervention development in primary healthcare settings. This study aimed to explore the feasibility and acceptability of an intervention using mobile health (mHealth) technology, together with counselling by a diabetes specialist nurse, to reduce occupational sitting in adults with type 2 diabetes.

**Methods:** Individual semi-structured interviews were conducted in 15 participants with type 2 diabetes who completed a 3-month intervention including mHealth; activity tracker (Garmin Vivofit3) and SMS reminders, one initial face-to-face patient-centred counselling session and three telephone follow-up calls by a diabetes specialist nurse within the primary healthcare system in Sweden. The interviews were recorded, transcribed verbatim and analysed using qualitative content analysis.

**Results:** Two themes were identified: (1) 'From baby steps to milestones' reflecting three categories; 'Small changes make it easier to reduce sitting', 'Encouraged by trustworthy coaching', 'Physical and mental rewards matter' and (2) 'Tailoring strategies that fit me and my workplace' reflecting four categories; 'It's up to me', 'Taking advantage of the support', 'Using creativity to find practical solutions for interrupting sitting' and 'Living up to expectations'.

**Conclusion:** The intervention was perceived as feasible and acceptable in different office workplaces, and led to increased awareness of sedentary behaviour in adults with type 2 diabetes. Stepwise goal setting together with personalization of the mHealth intervention should be emphasized in individual type 2 diabetes programmes aiming to reduce workplace sitting.

KEYWORDS

activity tracker, interventions, mHealth, occupational sitting, SMS reminders, Type 2 diabetes

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# 1 | INTRODUCTION

High volumes of daily sedentary time are associated with increased risk of cardiovascular disease, type 2 diabetes and all-cause mortality,[1] with the risks appearing to be more exaggerated among those who are physically inactive[2,3] and in those with impaired glucose regulation.[4,5] Evidence also suggests that adults with type 2 diabetes may spend more time sitting than those without type 2 diabetes.[6] Therefore, reducing and breaking up prolonged sedentary behaviour, even with brief bouts of daily low-intensity physical activity, may provide important health benefits for those with type 2 diabetes.[7,8]

Previous research has studied interventions targeting prolonged sitting at specific workplaces to reduce the risk of chronic diseases.[9] When aiming to reduce sitting time among office workers, work-based interventions typically use organizational, environmental and/or individual-level elements.[9] However, a paucity of evidence exists on workplace sedentary interventions conducted in clinical populations, such as those with type 2 diabetes.[10]

Mobile health (mHealth) technologies, such as activity trackers and SMS reminders, can be used to provide individualized feedback and seem to encourage and empower behaviour change in a cost-effective way in people with type 2 diabetes.[11] Several wrist-worn activity trackers include features such as individual goal setting and self-monitoring, which can strengthen patients' self-efficacy and motivation to be more physically active.[12] Moreover, activity trackers are also programmed to prompt the user after prolonged bouts of uninterrupted sitting. However, little is known about how these prompts are perceived and whether they provide sufficient support for reducing occupational sitting.

We aimed to explore the feasibility and acceptability of an intervention using mHealth (activity tracker and SMS reminders), together with counselling by a diabetes specialist nurse, to reduce occupational sitting in adults with type 2 diabetes.

**Novelty statements**

- To our knowledge, no previous research has explored the feasibility and acceptability of workplace interventions aiming to reduce occupational sitting in adults with type 2 diabetes
- A mHealth intervention, using activity tracker and SMS reminders, together with counselling and telephone follow-up by a diabetes specialist nurse, was perceived as feasible and acceptable and led to increased awareness of sedentary behaviour
- Stepwise goal setting and personalization of mHealth intervention may improve the outcomes of individual office-adapted programmes aiming to reduce occupational sitting in type 2 diabetes
- Our findings have relevance for researchers and practitioners by highlighting contextual factors such as a positive attitude among co-workers, trust from the employer and an office environment that support less sitting (e.g. sit–stand desks) which may need to be considered when implementing individualized sitting-reduction interventions

# 2 | METHODS

## 2.1 | Design and participants

This was a qualitative evaluation of a 3-month mHealth intervention. Participants were recruited across three primary healthcare centres in Sweden. Participants provided written informed consent and the study was approved by the Ethics committee in Umeå (Ref. no. 2017-260-31M, 2018-79-32M). Inclusion criteria were a diagnosis of type 2 diabetes, age 40–67 years, BMI ≥25 kg/m$^2$, $HbA_{1c}$ 55–100 mmol/mol (7.2–11.3%) and working at least 75% in a mainly sedentary occupation. The inclusion criteria were set to target people with increased risk for diabetes complications. Exclusion criteria were pregnancy, weight loss >6% last 6 months, regular high-intensity physical training, severe musculoskeletal pain or immobility, plans to change job or other obstacles in completing the protocol.

In all, 200 individuals identified via patient records and found to meet biometric inclusion criteria, received an introductory letter and underwent a telephone screening. Reasons for exclusion were retirement ($n = 65$), having a non-sedentary occupation ($n = 34$), unemployment ($n = 10$) or inability/unwillingness to participate ($n = 43$), while 21 did not answer the phone calls. Of the remaining 27, 12 individuals with an $HbA_{1c}$ <55 mmol/mol at baseline and were excluded. This left 15 individuals who met all inclusion criteria and participated in the study. There were no drop-outs during the study period.

## 2.2 | Intervention including mHealth

The intervention started with individual face-to-face counselling with a diabetes specialist nurse using a patient-centred approach focused on occupational sitting.[13,14] Results from the baseline 1-week activity measurements were used for reflection and to provide participants with tailored feedback on their daily activity patterns. Individual strategies to reduce occupational sitting and stepwise goals were then discussed and written down on a goal sheet (Appendix S1).[12,15,16]

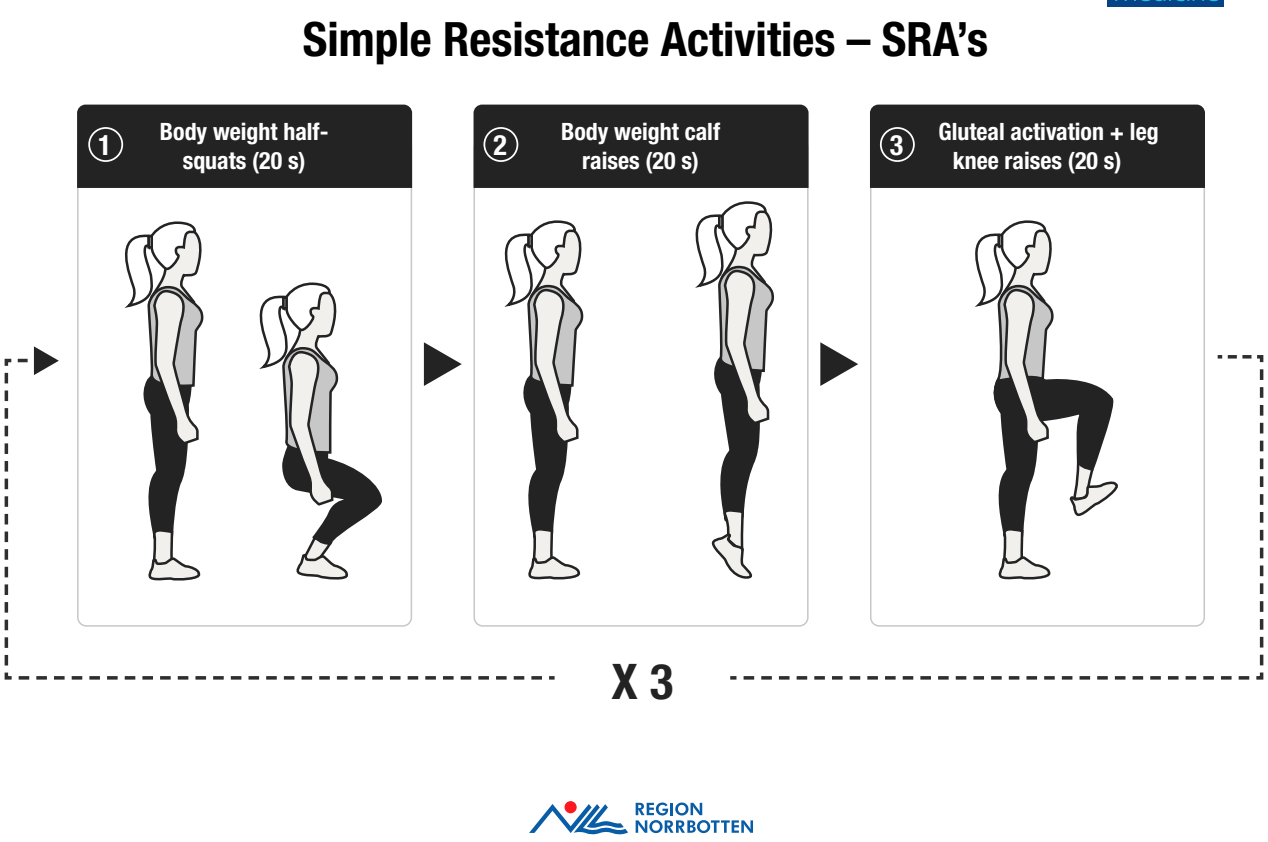


**FIGURE 1** Simple resistance activities, SRA's. By Cay Hedberg, adapted from Dempsey PC, et al. Benefits for type 2 diabetes of interrupting prolonged sitting with brief bouts of light walking or simple resistance activities. Diabetes Care 2016 June 01; 39(6): 964–972

Participants received written and verbal instructions on how to interrupt prolonged sitting, with gradual increases up to 3 minutes every 30 minutes of either simple resistance activities (Figure 1) or low-intensity walking.[8] Telephone follow-ups took place after 1, 5 and 9 weeks. Participants used an activity tracker wristband, Garmin Vivofit3 (Nordic Garmin Sweden AB Billdal) which prompts the user by displaying a red 'move bar' and delivering a low short beep after an hour of sitting still.[17] The 'move bar' resets again after walking a short distance or using an 'active minutes' function, for example, when doing simple resistance activities for 3 minutes. The activity tracker automatically creates a daily step goal based on previous activity levels and notifies the individual when the goal was reached. In addition, participants received regular SMS text reminders either daily or weekly (Appendix S2).

## 2.3 | Data collection

After participants and employers had given written informed consent, sitting time was measured for 7–10 consecutive days at baseline using a thigh-worn activPAL3 accelerometer (PAL Technologies Limited, Glasgow, UK).[18]

Sociodemographic variables were self-reported. Diabetes medications, complications and duration were collected using patient records. Standardized methods were used to measure BMI, waist circumference and $HbA_{1c}$ at baseline.

A semi-structured interview guide was developed. The interviews included open-ended questions focusing on how the intervention was perceived and barriers and facilitators to reducing occupational sitting (Appendix S3). Face-to-face individual interviews were conducted within 1–2 weeks after the study period by the first author (MBS; PhD student and general practitioner). The interviews lasted 52 minutes on average (range: 34–69 min) and were recorded and transcribed verbatim.

## 2.4 | Analysis

Participant characteristics and activity measurements at baseline were analysed using descriptive statistics. Qualitative content analysis with an inductive approach was used when analysing the transcribed interviews.[19] An inductive content analysis approach was chosen since there were no previously defined theories to be tested nor relevant studies published at the time of dealing with this subject.[20]

**TABLE 1** Examples of meaning units, condensed meaning units and codes.

| Meaning unit | Condensed meaning unit | Code |
|---|---|---|
| 'When seeing the red marks [*at activity tracker*] one simply had to get up and move' | Red inactivity bar made one get up and move | Activity tracker is an alarm clock |
| 'It [the brain] feels even better from moving a little, than from the regular sitting coffee break' | The mind feels better from breaking up the sitting time | Clears the mind |
| 'To break up the sitting time for three minutes goes fast and make you more alert and helps to endure the time that is left' | Three minutes goes fast and make you more alert | Doesn't take much time |

The analysis was conducted by authors MBS (first author), EF, MN and PW. The process included both naïve reading of all transcribed interviews to obtain a sense of the whole and interpretation of latent content of the interviews.[19] Each author explored the first four interviews for ´meaning units´, that is, words or statements related to the purpose of the study.[19] Meaning units has been defined as sentences containing aspects related to each other through their content and context.[19] Cross-checking the first four interviews revealed almost identical extraction of meaning units between the authors. Any differences were discussed until agreement was reached. The first author then coded the remaining interviews. In a series of meetings between the authors, the meaning units were further condensed (i.e. shortened while still preserving the core meaning) and labelled with codes (Table 1). Through a process of reflection and discussion between the four authors, codes were interpreted and compared for differences and similarities and sorted into categories and formulated into two overarching themes. During all steps in the analysis process, interviews were re-read to reject, confirm or reformulate the codes and category labels to increase the credibility.

## 3 | RESULTS

Participant characteristics and activity measurements at baseline are presented in Table 2 to enable the reader to validate the transferability of the findings. Eight men and seven women (median age: 58) participated. Duration of type 2 diabetes varied from newly diagnosed to over 10 years post-diagnosis. Four out of 15 participants had mild diabetes complications and medical treatment differed between participants. Number of steps and total sitting time on workdays varied greatly (Table 2). Different professions were represented, including: receptionist, secretary, IT support, military personnel, teacher and researcher.

Two overarching themes were identified in the analysis: 'From baby steps to milestones' and 'Tailoring strategies that fit me and my workplace' and were exhibited over seven categories. In the following section, the categories are described and illustrated by citations as subheadings under the corresponding themes. Themes, categories, codes and illustrative quotes are provided in Appendix S4.

### 3.1 | Theme 1: From baby steps to milestones

#### 3.1.1 | Small changes make it easier to reduce sitting

Many participants expressed a lack of awareness about the time they spent sitting at work. They had not reflected upon the amount of time they spent sedentary, nor had they previously considered reducing sitting time. Gaining an awareness of the amount of time they spent sedentary was an important facilitator for reducing it.

Many described that they changed their behaviour step by step after overcoming the initial 'inner resistance' to both increase daily steps and to use sit-stand desks.

> I started little by little. In the beginning my buttocks felt heavy when I had been in the office, but now it works better and better. Now I have been standing a whole week. (ID10)

Many were surprised that it was easier to reach their goals than they had expected. Interrupting sitting by taking a walk or doing simple resistance activities was experienced as uncomplicated and not time-consuming.

#### 3.1.2 | Encouraged by trustworthy coaching

The diabetes nurse took the role of a coach, helping participants to reflect on their sedentary behaviour and how to reduce it. It was appreciated that the diabetes specialist nurse talked candidly and provided trustworthy advice. Participants found the diabetes specialist nurse easy to understand, structured and engaging, but at the same time non-judgemental.

> She has been very, very, how should I put it, kind in that [*guidance*]. She has not…There has not been any, like finger-pointing or such. (ID12)

Phone calls were appreciated because they provided an opportunity for individual guidance. The diabetes nurse did not give any 'off-the-shelf answers' which gave participants a possibility to think for themselves and use their own initiative.

**TABLE 2** Baseline characteristics of the participants.

| | *n* |
|---|---|
| Age, years | |
| Mean ± SD (range) | 55 ± 7 (42–65) |
| 42–45 | 2 |
| 46–50 | 2 |
| 51–55 | 3 |
| 56–60 | 5 |
| 61–65 | 3 |
| Gender | |
| Female | 7 |
| Male | 8 |
| Years since diabetes diagnosis | |
| <1 | 1 |
| 1–5 | 4 |
| 6–10 | 5 |
| 10≥ | 5 |
| Education | |
| Elementary school | 1 |
| Secondary school | 6 |
| Tertiary education | 8 |
| Household, living | |
| Alone | 4 |
| With a partner | 11 |
| Oral diabetes medication, number | |
| None | 1 |
| 1 | 5 |
| 2 | 5 |
| 3 | 4 |
| Treated with insulin, number of participants | 4 |
| Treated with GLP−1 analogues | 6 |
| Diabetes complications, number | |
| None | 11 |
| Diabetes retinopathy | 2 |
| Diabetes retinopathy and polyneuropathy | 2 |
| $HbA_{1c}$ (mmol/mol) | |
| Mean ± SD (range) | 71 ± 13 (55–96) |
| $HbA_{1c}$ (%) | |
| Mean ± SD (range) | 8.7 ± 1.2 (7.2–10.9) |
| BMI ($kg/m^2$) | |
| Mean ± SD (range) | 32.4 ± 4.9 (25.3–40.0) |
| Waist circumference, female (cm) | |
| Mean ± SD (range) | 112 ± 11 (101–131) |
| Waist circumference, male (cm) | |
| Mean ± SD (range) | 111 ± 14 (94–131) |
| Steps, workdays | |
| Mean ± SD (range) | 7564 ± 2548 (3899–12194) |
| Sitting time (h), workdays | |
| Mean ± SD (range) | 10.2 ± 2.5 (4.7–14.9) |

> The meetings with the diabetes nurse have been good because…Even if the activity tracker reminds me to do these different activities, these meetings with her have made me understand why I needed to do this. (ID4)

### 3.1.3 | Physical and mental rewards matter

Participants described many physical and mental effects. They also reported feeling more energetic and alert and experienced less mental fatigue. Leaving the office for a couple of minutes relieved their stress and allowed them to clear their mind.

> It is also an advantage if you get going/activate yourself, so you get away from the stress you're sitting in. The phone is ringing constantly… You get a break from it for a while. (ID13)

Many participants expressed feelings of better general well-being; some got better sleep, some improved their posture and some felt happier when getting in better shape. Some reported less back pain and some commented on improvements in their laboratory results. Many mentioned that they were 'chasing' steps and some competed with themselves. Reaching the 'goal' in the activity tracker was satisfying and seen as a reward.

> So little is needed; 'Look, now I have reached my goal for today'. That's positive. (ID13)

Many were gradually increasing their step targets once they reached earlier goals.

> I am hunting my 10 000 steps and if I don't have time to get them all at work every day, then it will be where I live. (ID15)

## 3.2 | Theme 2: Tailoring strategies that fit me and my workplace

### 3.2.1 | It's up to me

There was a desire to engage in lifestyle changes through their own initiative; to decide what kind of activities to choose and

how to do them. Family support was experienced as positive, but not crucial.

> I had thought that this is something I'm going to fix by myself. I have been thinking all the way; it is up to me to do it, not for my relatives, it is up to me. (ID3)

Interrupting sitting at work was perceived as taking their own initiative. Once the participant had made the decision to break up their sitting time, what others thought had little impact.

> I get up and walk my 'round', it has become my thing. Other people at my work maybe sit down on a cosy armchair and relax for a while. But for me it has become my routine, I go outside and walk my round. (ID15)

Everybody experienced that they had made some changes. Many were proud of becoming more active and many described gaining better self-confidence. Participants felt they had to push past their own internal barriers for interrupting sitting, that is, to overcome an 'inner resistance', before taking a short walk outside, especially when the weather was cold.

> The hardest part for me is to get my workout clothes on, it's some kind of an inner resistance. But I have done it...'No turning back, just to walk that walk'. (ID2)

### 3.2.2 | Taking advantage of the support

Although employers were not interviewed, they were perceived by the participants, as mostly having a positive attitude towards interrupting sitting. Many, but not all, had helpful appliances such as sit–stand desks, balance boards or mats to stand on, and flexibility in choosing working position. Most participants could work independently which made it possible to take breaks when needed. No one experienced that interrupting sitting had negative impact on productivity. There was a general acceptance for more movement at the workplaces, and colleagues were encouraging. In some workplaces, others started to change their behaviour as well by incorporating simple resistance movements and/or using sit–stand desks.

> It is contagious. There were many who started to stand, because I told them about this [*study participation*] and I showed them the brochures I got from the diabetes nurse, and all of a sudden there were many others who started to stand. (ID5)

### 3.2.3 | Using creativity to find practical solutions for interrupting sitting

Participants appeared to find creative ways to utilize the different components of the intervention to reduce sitting time. Many appreciated the simple resistance activities and felt they were easy to do, did not take much time and could be done by the desk. For example, simple resistance movements were chosen when the weather was cold and outdoor walks were not favourable. On the other hand, many did not use simple resistance activities at all because they felt silly, ineffective or boring. The most popular way to break up the sitting time were short, indoor walks. Participants wanted to avoid negative attention from the co-workers. Walking to talk with colleagues instead of calling or mailing, taking the stairs, walking to the printer or to get some water were mentioned as some of the ways to integrate sitting time reductions around work tasks in discrete ways. Lacking a sit–stand desk and certain work tasks like meetings were mentioned as barriers for interrupting sitting.

> It may have been strange if I had to get up in the middle of the meeting and say, 'Now I must go out and take a walk', then they might have been annoyed [*laughing*]. (ID12)

Those who appreciated the SMS reminders found them inspiring and helpful to interrupt sitting. Especially early in the intervention, the SMS reminder helped participants to initiate new routines. The activity tracker was used by all participants but to act and find practical solutions varied. The activity tracker was perceived as a cue to move and was hard to ignore. Some tried to prevent the 'move bar' appearing in the activity tracker by interrupting sitting more often. Some chose to take either a short walk or to do simple resistance activities.

> This watch [*activity tracker*] has been really good, I have been looking at it:' Oh, now it's red, now I must get up and move'. (ID1)

The 'move bar' could also be ignored when participants wanted to finish a work task before rising, which created a conflict between work tasks and interrupting sitting time.

> One can get stuck in a certain work task maybe and then you want to finish it. There are many different inputs all the time, there's the mail, you have customers, the phone…It's these kind of things that probably make it more difficult to…to not remain sitting and stand up. (ID6)

When it was foreseen that activity breaks during the workday would be problematic, for example due to having a lot of

meetings, sitting time was consciously compensated by taking walks before and after work or during the lunch break. To leave the sit–stand desk in an upper position facilitated standing when returning to the desk after a break.

### 3.2.4 | Living up to expectations

Participants did not want to break the agreement they had made with the diabetes nurse. They felt that regular telephone follow-ups helped them stick to their plan. Participants wanted to avoid feelings of embarrassment and guilt. They felt it was important to make themselves proud and that it would be disappointing if they did not reach their goals. Participants experienced a sense of relief in being able to do their daily movement at work when they were unable or lacking time or motivation to be active during leisure time.

> In the evening I feel; 'I don't need to walk anymore today; I can watch TV with good conscience'. (ID5)

## 4 | DISCUSSION

The findings from this study indicate that an intervention using mHealth, together with counselling by a diabetes specialist nurse targeting occupational sitting, is feasible and acceptable to implement across different workplaces for people with type 2 diabetes. Feedback from the activity tracker was also perceived positively by the participants and helped to increase awareness of their sedentary time. Two key themes were identified by participants´ experiences of the mHealth intervention. The first theme, 'From baby steps to milestones', reflects a process of first gaining greater awareness of the amount of time spent sitting, followed by the insight that it was uncomplicated to make small behavioural changes one step at a time. Furthermore, individual coaching by a diabetes specialist nurse and perceptions of both mental and physical health benefits were experienced as encouraging. The second theme, 'Tailoring strategies that fit me and my workplace', describes the importance of participants finding their own strategies and initiatives to reduce occupational sitting time, and engaging in changes for their own sake. Overall, these findings may be relevant to future studies aiming to translate the promising short-term results of sedentary interventions on metabolic markers in people with type 2 diabetes [7,8] into longer-term trials in real-world contexts.

Expertise and guidance from the diabetes specialist nurse was highly appreciated. Similar to Lawton et al., we found that people with type 2 diabetes value clear information and communication with a diabetes nurse.[21] Interestingly, family support was experienced as positive, but did not seem to play a major role the participants' behavioural change. Indeed, since the intervention focused more on workplace activity, family support may have been perceived as less relevant.

Participants in the current study experienced less perceived fatigue when sitting less and moving more. Similar findings in adults with type 2 diabetes were seen in a recent acute cross-over trial, which suggested that prolonged uninterrupted sitting increased fatigue relative to sitting interrupted with regular brief activity breaks.[22] Qualitative findings following a 12-month intervention also noted perceived improvements in alertness and concentration, corroborating the current findings.[23]

Many participants experienced a need for personal integrity and autonomy. It was appreciated that the diabetes nurse was non-judgemental. Central to self-determination theory is the concept of respecting individual's ability to make decisions. In other words, nurses can advise but at the same time should respect and foster autonomy.[24]

Both facilitators and barriers for interrupting sitting at work were identified in our analysis. Participants felt that their employer trusted them, which gave participants flexibility to break up prolonged sitting during the workday. Participants did not experience impediments to their productivity, but they were wary of what their co-workers might think, which was perceived as a barrier for interrupting sitting. This has also been recognized as a barrier in a review and thematic synthesis of other qualitative studies of reducing occupational sitting.[23]

In a Spanish qualitative study of overweight people, one of the main barriers to reducing sitting time was perceived lack of time.[26] Participants in our study also mentioned lack of time as a barrier. When working intensely on a work task, they perceived themselves to have less time to interrupt the sitting. Planning for daily activities in advance seemed to be an important strategy to help work around these barriers.

Participants demonstrated ingenuity in finding practical ways to break up sitting time. Integrating work and movement by short indoor walks, for example, walk to colleagues instead of calling or emailing or frequent trips to the printer, were mentioned as popular ways to reduce sitting time. This kind of 'purposeful walking' was also seen as one of the strategies in the Stand Up Victoria trial.[27,28]

Goal setting is known to be an important factor in the motivational process and is supported by Social Cognitive Theory.[12] The activity tracker with a goal setting function provided the opportunity to set a series of subgoals for amount of steps per day. Participants had the opportunity to re-evaluate their goals for reduced occupational sitting when in contact with the diabetes specialist nurse. It seemed important for self-efficacy to initially set achievable goals. Goal achievement was experienced self-motivating and provided self-satisfaction. Previous research supports the hypothesis that pedometers can work as long-term facilitators to help reduce physical inactivity.[29] It seems that strategies used by

activity trackers to support increased physical activity can also support reductions in sedentary behaviour.

One motivation for participants to change their behaviour was to avoid feelings of guilt. Wycherley et al. examined facilitators of maintenance in a lifestyle intervention programme for people with type 2 diabetes [30] and also found that one reason for persisting was a desire to stick with their commitment and not let the research organization down.[25,30]

### 4.1 | Strengths and limitations

This study provides new insights on how interrupting prolonged sitting is experienced by people with type 2 diabetes. The intervention was designed on the basis that it would be easy to implement within the typical primary healthcare system, integrated in the regular diabetes specialist nurse check-ups. During the analysis process, there was an open dialogue in the research team regarding the semi-structured interview questions which adds credibility (internal validity) to the study. Confirmability was assessed by seeking agreement in the analysis by a dialogue among co-researchers.[19] Systematic methodologies were used to establish credibility in the analysis.[19,20]

All the interviews were conducted within 1–2 weeks after study to reduce risk for recall bias.[19] The first author (MBS) conducted all of the interviews, but was not a healthcare provider for any of the participants. Questions about both positive and negative experiences were asked.

A key limitation is that those who participated in the present study were likely to be more motivated, which may affect the transferability (generalizability) of the findings to people with lower motivation.[19] It should be noted, however, that participants had not reached adequate blood glucose control despite intensive medication. Our participant sample was also quite heterogeneous in terms of activity levels, age, and diabetes duration and diabetes medications and came from different workplaces, which may improve the transferability of the findings.[19] Given that employers were perceived by participants as having a positive attitude towards interrupting sitting, it would have been informative to interview some of the employers as well. Future research should consider this. Whether our findings are generalizable to other countries depends on workplace conditions, but may also depend on how diabetes care is delivered and organized.

### 4.2 | Implications for practice

Our findings highlight the importance of individually tailored approaches when aiming to stimulate changes in workplace sitting among people with type 2 diabetes, with a variety of strategies appearing to be helpful.[27] Caregivers supporting people with type 2 diabetes aiming to change sitting time at work should use a patient-centred approach, enabling patients to choose what strategies work best in their work environment and tasks.[12,14,16,27] Activity trackers that prompt reductions in prolonged sitting and support stepwise goal-setting, regular SMS-reminders and simple resistance activities may facilitate patients to reduce sitting time at work. Importantly, engagement in health behaviours is not merely a question of individual responsibility and motivation. A positive attitude towards interrupting prolonged sitting among co-workers and employers, as well as an office environment that supports less sitting, was also perceived as important facilitators.

## 5 | CONCLUSIONS

The mHealth intervention was perceived as acceptable among different office workplaces and feasible to implement for adults with type 2 diabetes within the typical primary healthcare system in Sweden. mHealth provides tools and strategies which may increase awareness of sedentary behaviour and facilitate stepwise reductions in occupational sitting.

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### CONFLICTS OF INTEREST

The authors had no conflict of interest in connection with this paper.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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